Raytheon

Use of an Organizational Process for Corporate-Wide Process Improvement via CMMI®

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Customer Success Is Our Mission

One Company integration through a common program

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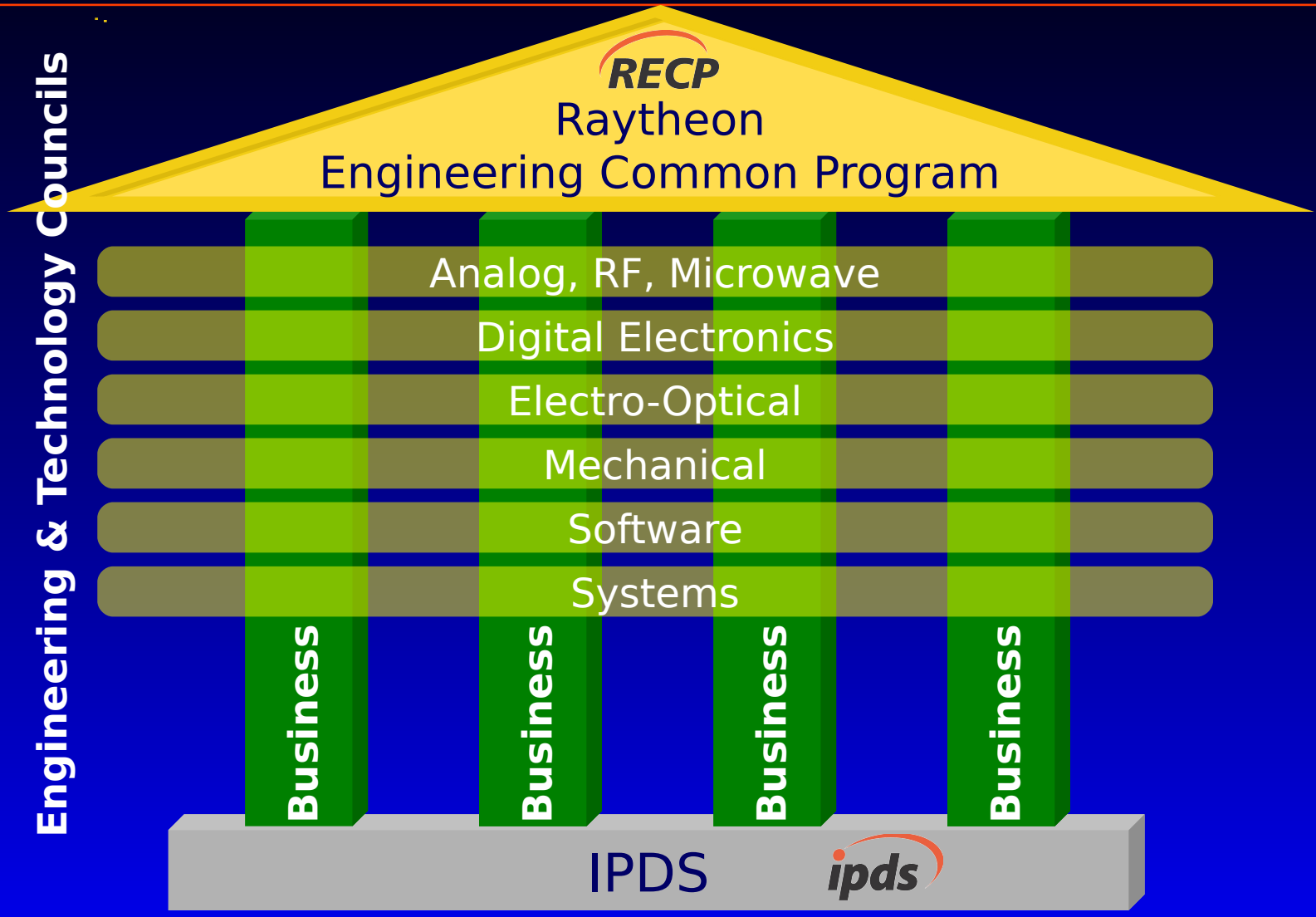

RECP – Recipient of AFEI's 2003 Industry award for Excellence in Enterprise Integration

Raytheon's Common Process Culture

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Integrated Product Development System (IPDS) provides an integrated set of best practices for the entire product development life cycle using a program tailoring process.

Raytheon Six Sigma guides us to use CMMI® and IPDS as tools to deliver value to customers and integrate industry best practices.

Capability Maturity Model Integration (CMMI®) provides the requirements for creating, measuring, managing, and improving specific processes.

Raytheon Engineering Common Program is the enterprise enabler for these initiatives

Executing Enterprise CMMI® Strategy

- **Incorporated changes to bring IPDS into Level 3 compliance with CMMI®**
- **Update IPDS to Level 5 compliance using incremental releases**
- **Upgrading support infrastructure in conjunction with IPDS upgrades (web sites, Process Asset Libraries, tools…..)**
- **Supporting Raytheon businesses in their CMMI® deployment, training, appraisals, and improvements**
- **Continuing involvement in external activities with CMMI®**
- **Teaming with the Software Productivity Consortium**

Building on successful (IPDS) process deployment and usage expedites CMMI® deployment

The Vision

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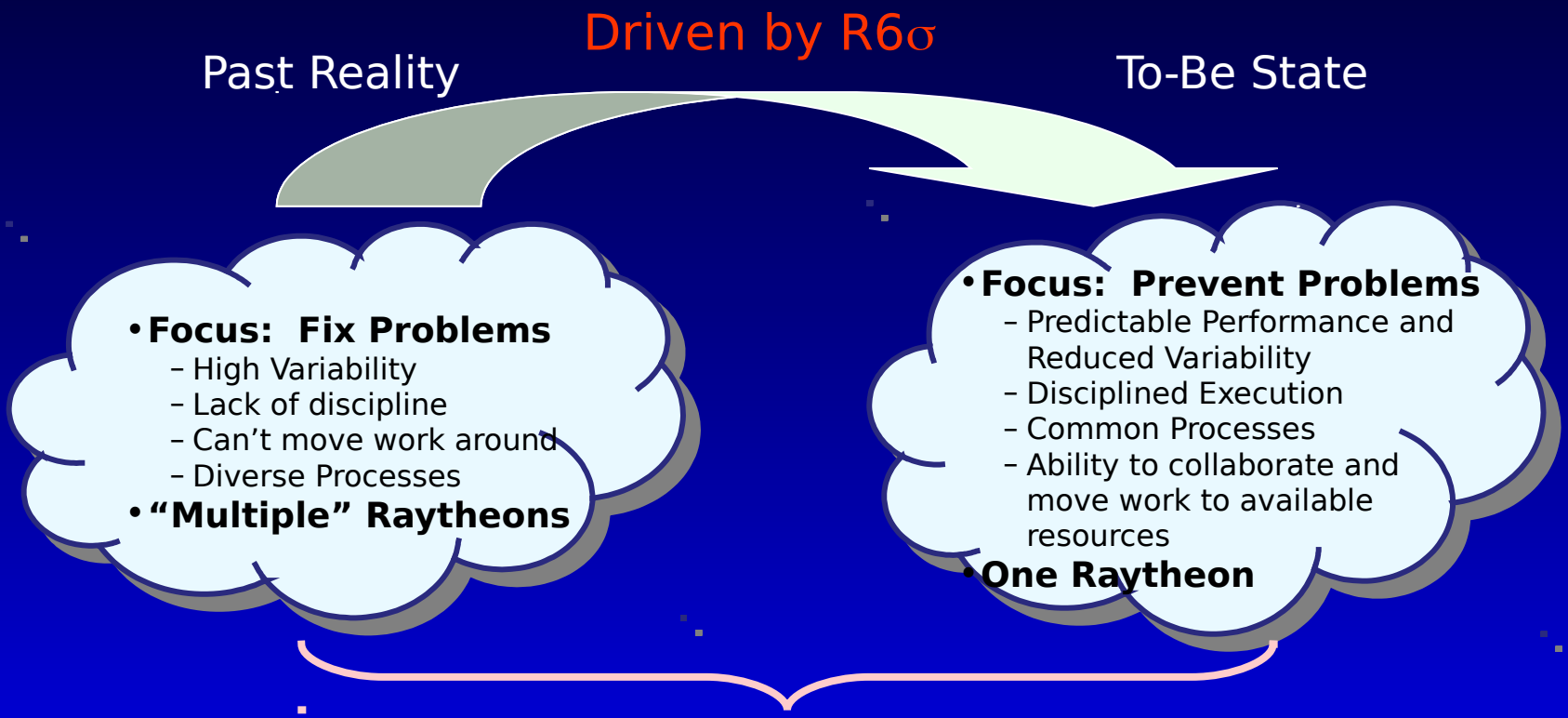
Leveraging R6σ improvements corporate-wide



Captured in IPDS - Validated by CMMI®

History of IPDS

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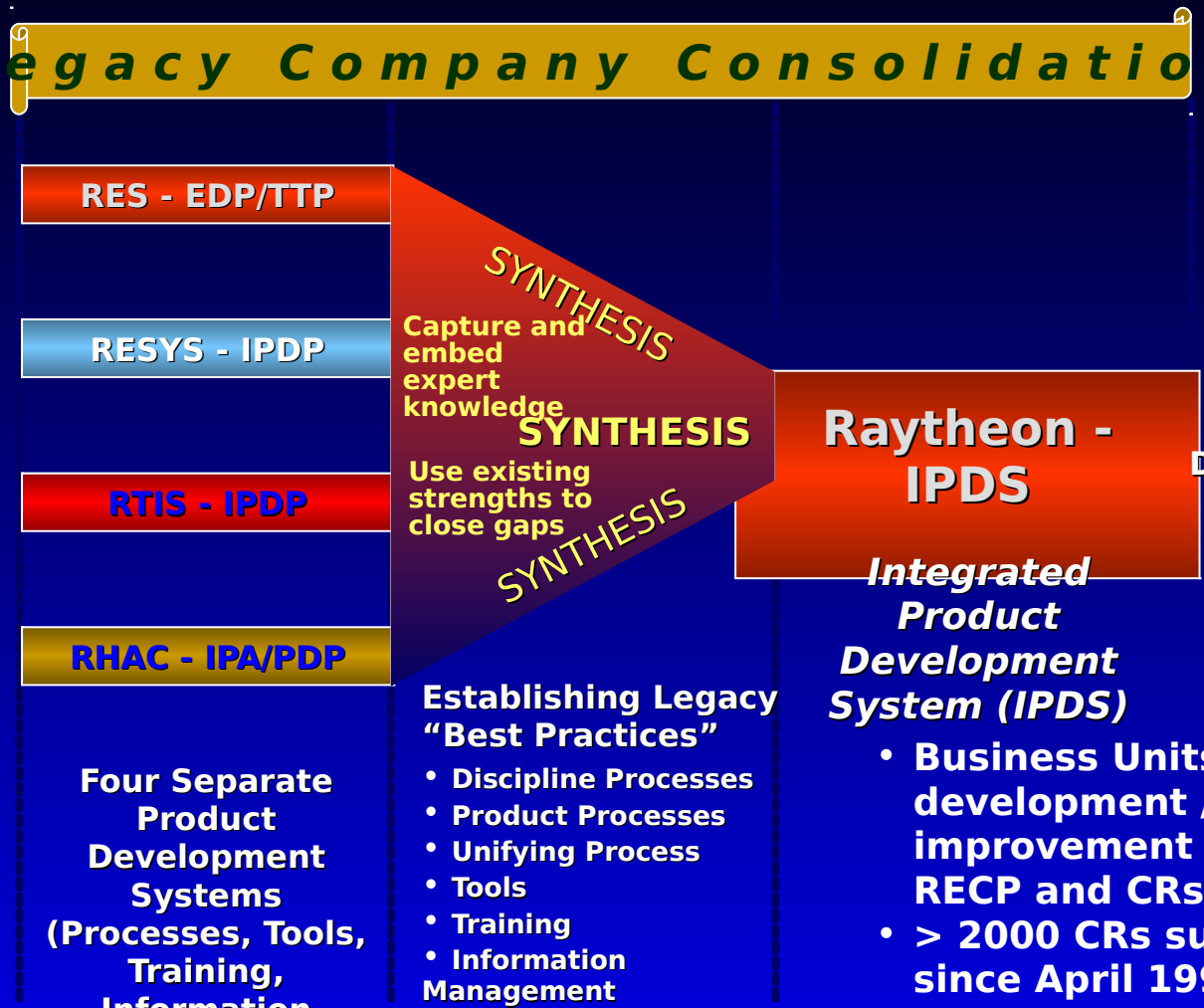

Based on Industry and Commercial Standards

EIA 632
Processes for Engineering a System

ISO 12207
Information Technology: Software Life Cycle Processes"

IEEE 1220
Standard for Application and Management of the Systems Engineering Process

Four Separate Product Development Systems (Processes, Tools, Training, Information Management)

Establishing Legacy "Best Practices"

- Discipline Processes
- Product Processes
- Unifying Process
- Tools
- Training
- Information Management

for the RSC common Product Development System

Goals

Reduced Cycle Time, Defects/Unit and Cost

- **Business Units drive IPDS development / improvement through RECP and CRs**
- **> 2000 CRs submitted since April 1998; led to 10 improved releases of IPDS**

Integrated Product Development System

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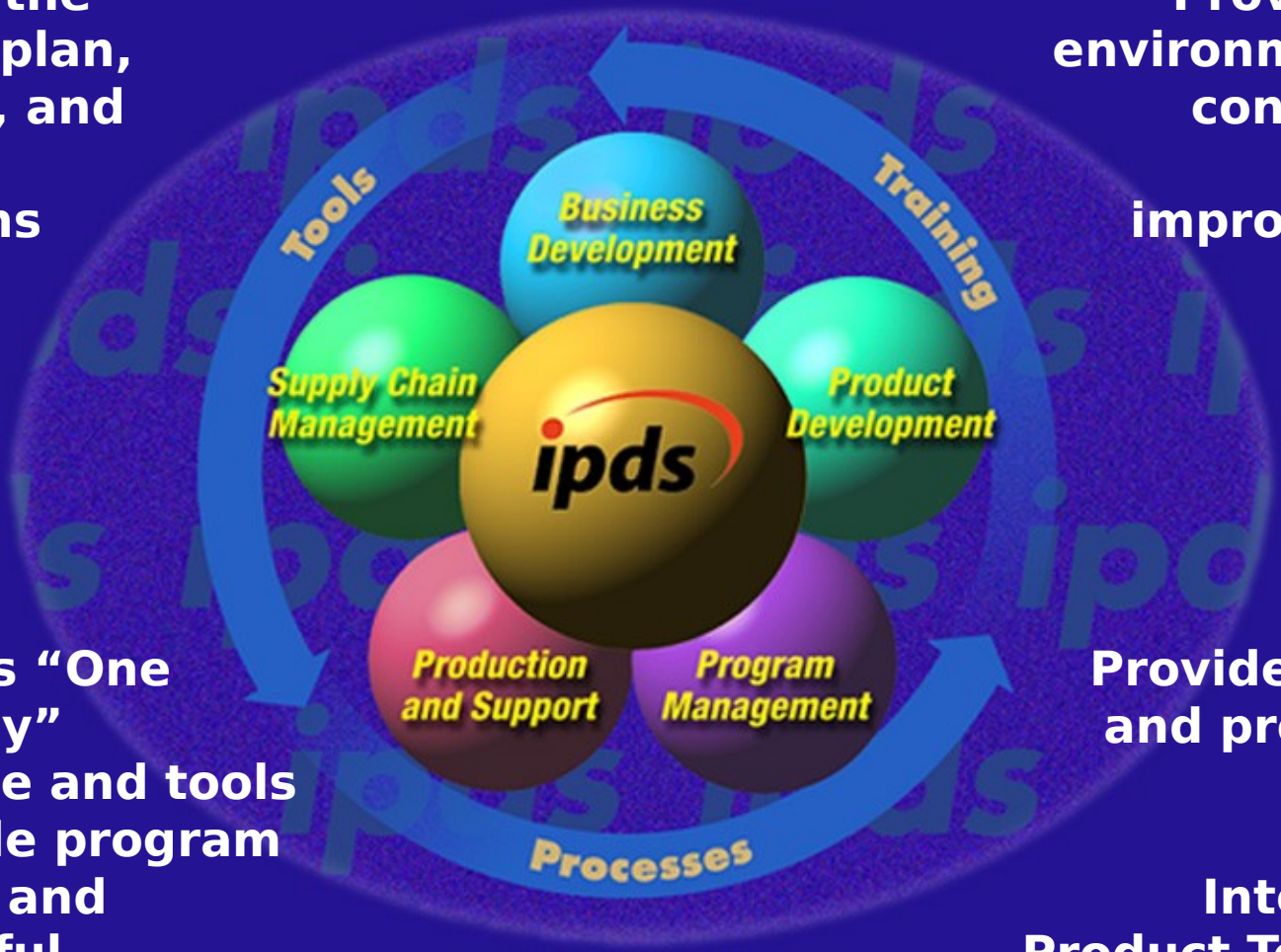
Defines the way we plan, capture, and execute programs

Provides an environment for continuous process improvement



Provides "One Company" language and tools to enable program capture and successful

Provides tools and processes that enable Integrated Product Teams to tasks

Building a Process Culture Requires Discipline

Web Shot of IPDS

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Return to Home Page (shown)

Access to Main and Sub-Process Info

Access to Supporting Process Info

Access to Gates Info

Access to Deployment Info

Access to Site Search Engine

Access to IPDS Processes and Policies

Access to Contact Info for IPDS

Access to IPDS Help Desk

Access to Enablers

Access to IPDS Glossary/ Acronym List

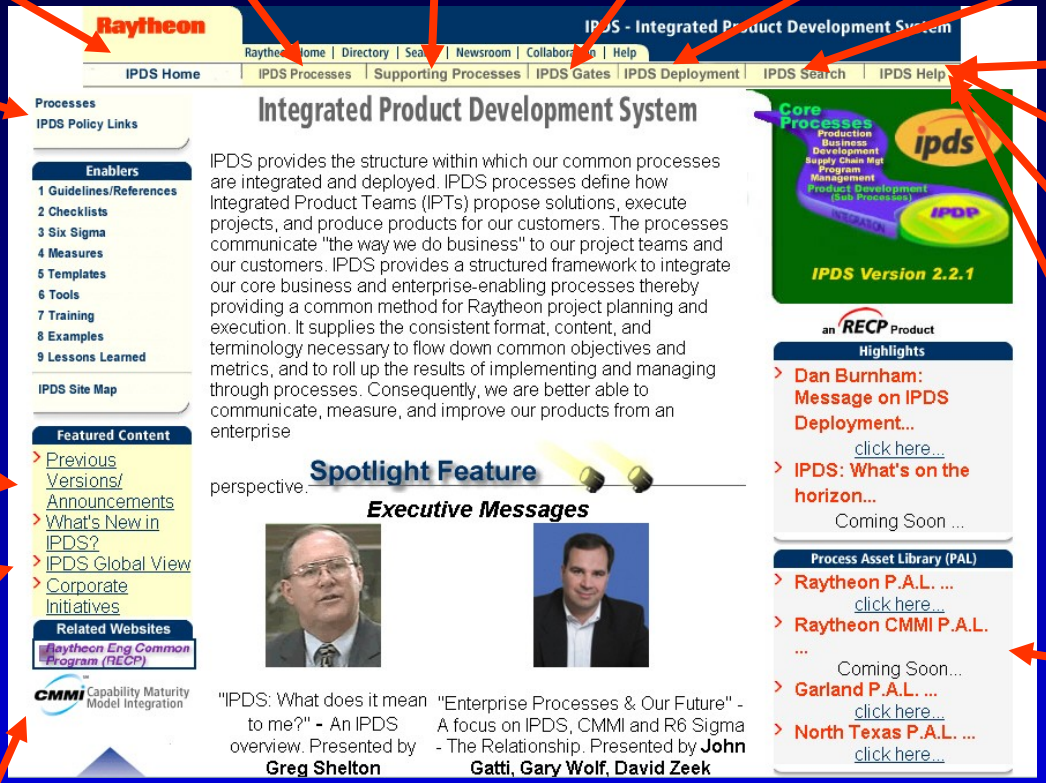
Access to Version Description

Access to IPDS Change Process

Access to Global View of IPDS

Access to Process Asset Libraries (PALs)

Access to Related Websites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IPDS - Integrated Product Development System
IPDS Home
IPDS Processes
Supporting Processes
IPDS Gates
IPDS Deployment
IPDS Search
IPDS Help
Processes
IPDS Policy Links
Enablers
1 Guidelines/References
2 Checklists
3 Six Sigma
4 Measures
5 Templates
6 Tools
7 Training
8 Examples
9 Lessons Learned
IPDS Site Map
Featured Content
Previous Versions/ Announcements
What's New in IPDS?
IPDS Global View
Corporate Initiatives
Related Websites
Raytheon Eng Common Program (RECP)
CMMI Capability Maturity Model Integration
Integrated Product Development System
IPDS provides the structure within which our common processes are integrated and deployed. IPDS processes define how Integrated Product Teams (IPTs) propose solutions, execute projects, and produce products for our customers. The processes communicate "the way we do business" to our project teams and our customers. IPDS provides a structured framework to integrate our core business and enterprise-enabling processes thereby providing a common method for Raytheon project planning and execution. It supplies the consistent format, content, and terminology necessary to flow down common objectives and metrics, and to roll up the results of implementing and managing through processes. Consequently, we are better able to communicate, measure, and improve our products from an enterprise perspective.
Spotlight Feature
Executive Messages
"IPDS: What does it mean to me?" - An IPDS overview. Presented by Greg Shelton
"Enterprise Processes & Our Future" - A focus on IPDS, CMMI and R6 Sigma - The Relationship. Presented by John Gatti, Gary Wolf, David Zeek
Core Processes
ipds
IPDP
IPDS Version 2.2.1
an RECP Product
Highlights
Dan Burnham: Message on IPDS Deployment... click here...
IPDS: What's on the horizon... Coming Soon ...
Process Asset Library (PAL)
Raytheon P.A.L. ... click here...
Raytheon CMMI P.A.L. ... Coming Soon...
Garland P.A.L. ... click here...
North Texas P.A.L. ... click here...

Deployment Methods Are Integral to IPDS

PROCESS DOCUMENTATION AND ENABLERS

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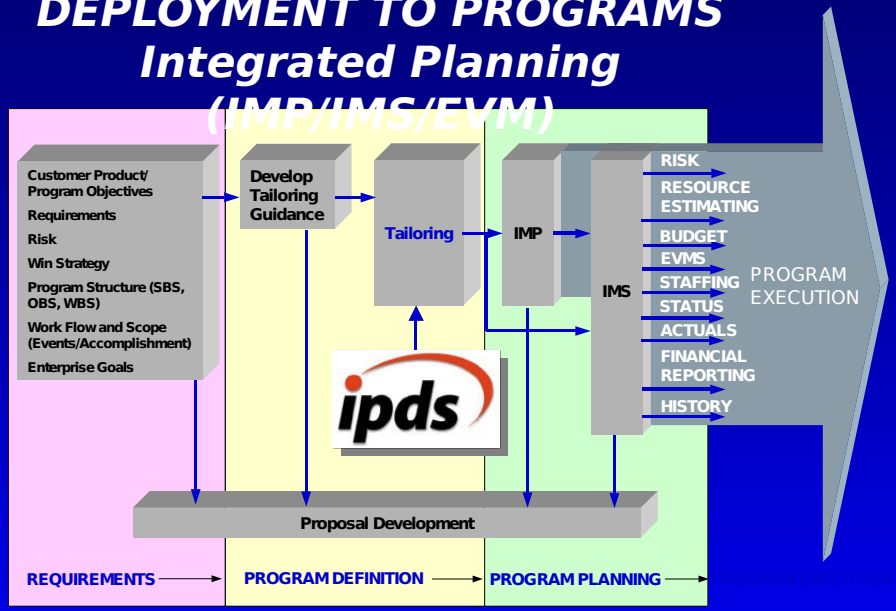
IPDS - Integrated Product Development System
Integrated Product Development System
IPDS provides the structure within which our common processes are integrated and deployed. IPDS processes define how Integrated Product Teams (IPTs) propose solutions, execute projects, and produce products for our customers. The processes communicate "the way we do business" to our project teams and our customers. IPDS provides a structured framework to integrate our core business and enterprise-enabling processes thereby providing a common method for Raytheon project planning and execution. It supplies the consistent format, content, and terminology necessary to flow down common objectives and metrics, and to roll up the results of implementing and managing through processes. Consequently, we are better able to communicate, measure, and improve our products from an enterprise perspective.
Spotlight Feature
Executive Messages
IPDS Version 2.2.1

- ***PROCESSES***
  - ***TASK DESCRIPTORS***
  - ***GUIDELINES & REFERENCES***
  - ***METHODS / PROCEDURES***
  - ***CHECKLISTS***
  - ***TEMPLATES***
- ***TOOLS***
  - ***PRODUCIBILITY / DFMA***
- ***MEASURES***
- ***TRAINING***

DEPLOYMENT TO PROGRAMS Integrated Planning (IMP/IMS/EVM)



Aligned

- Product Structure
- WBS
- Program Organization

ORGANIZATIONAL DESIGN Multidiscipline, Customer Focus

- ***INTEGRATED PRODUCT TEAMS***
- ***TEAM BUILDING***

Integrated Product Development Process Is the Overarching Process

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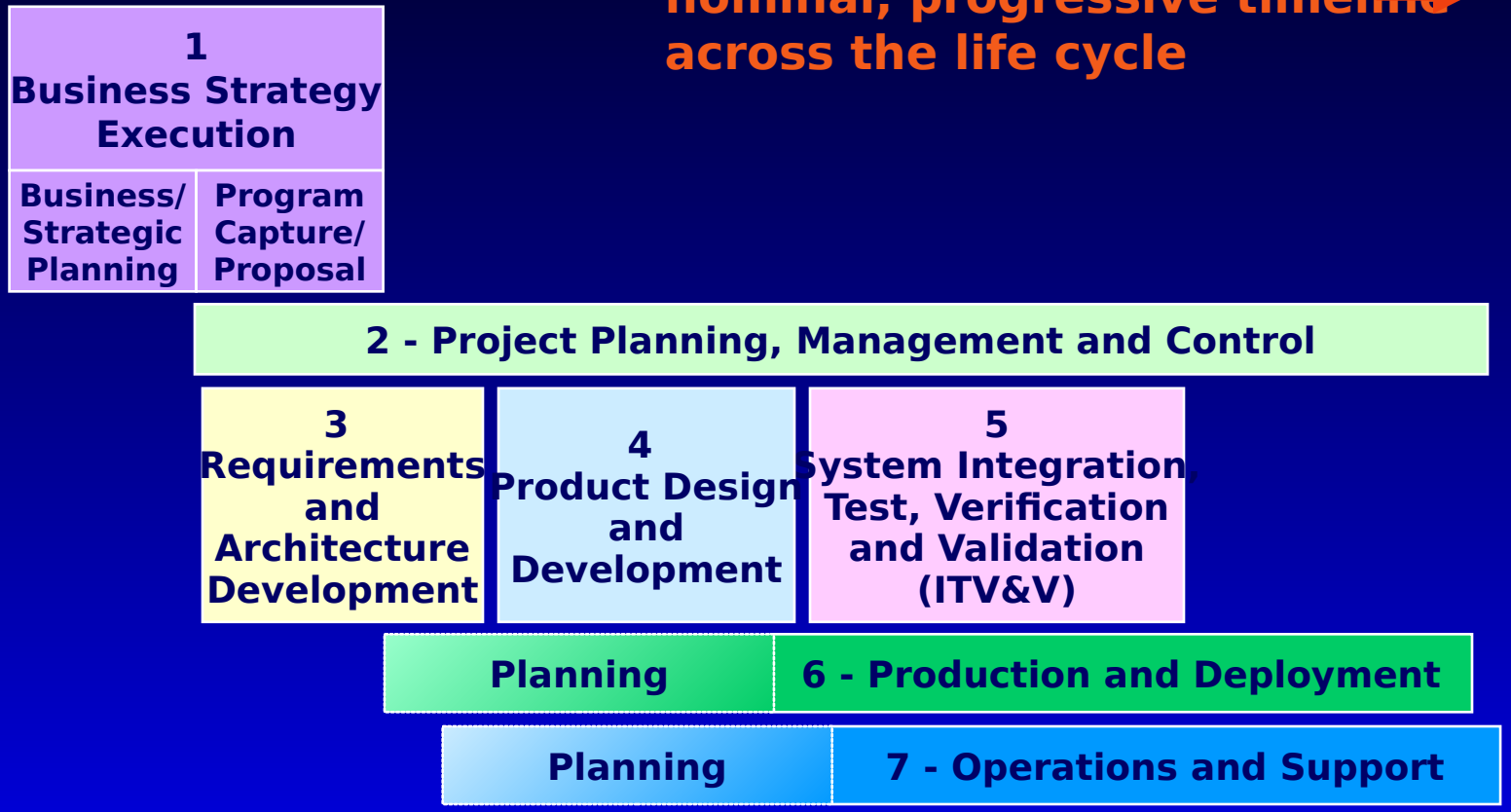
Horizontal navigation follows nominal, progressive timeline across the life cycle



IPDP Documentation Hierarchy

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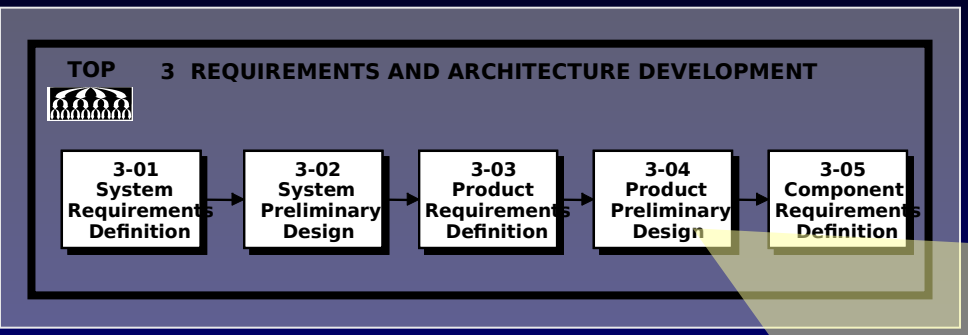
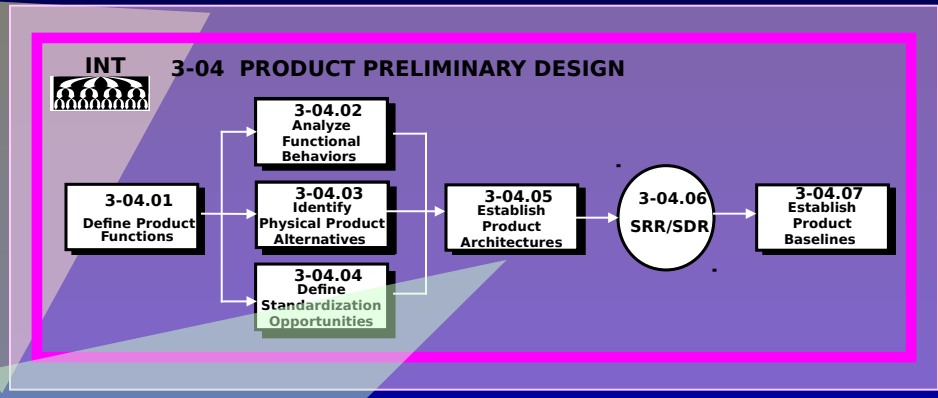
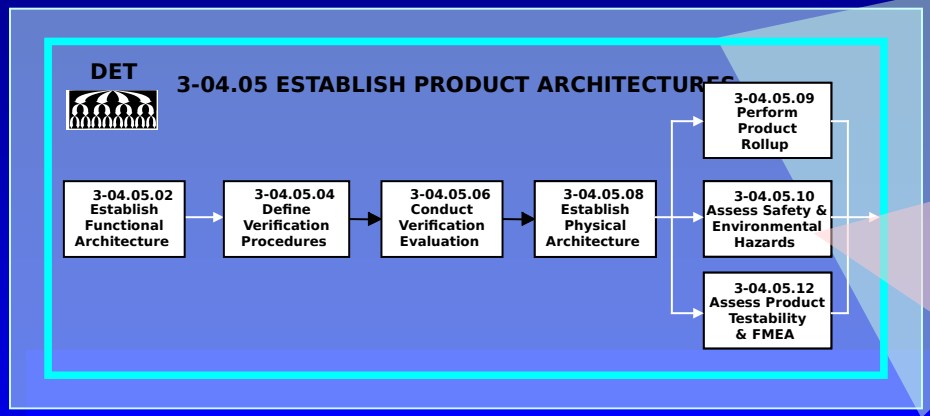
Vertical hierarchy reveals successive levels of detail



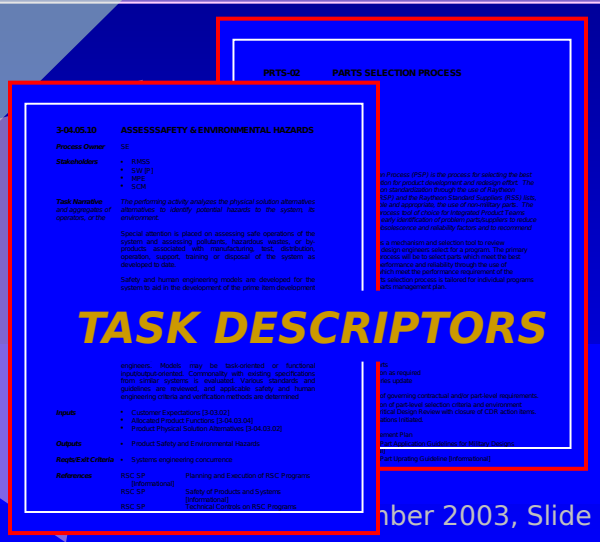
LEVEL 1 FLOWCHART

LEVEL 2




DET
3-04.05 ESTABLISH PRODUCT ARCHITECTURES
3-04.05.02 Establish Functional Architecture
3-04.05.04 Define Verification Procedures
3-04.05.06 Conduct Verification Evaluation
3-04.05.08 Establish Physical Architecture
3-04.05.09 Perform Product Rollup
3-04.05.10 Assess Safety & Environmental Hazards
3-04.05.12 Assess Product Testability & FMEA

LEVEL 3



TASK DESCRIPTORS

IPDP Includes Program Check Points Called Gates

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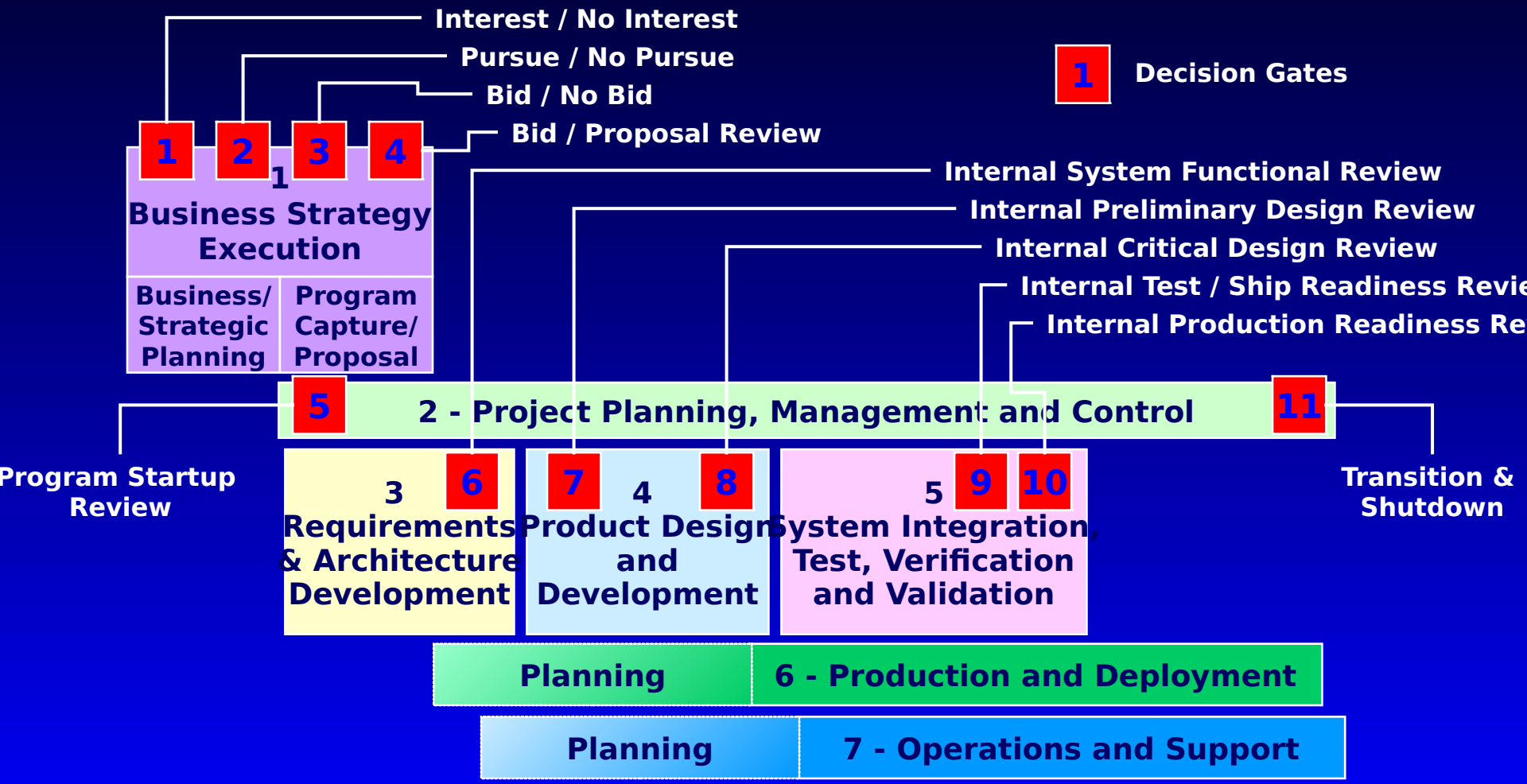
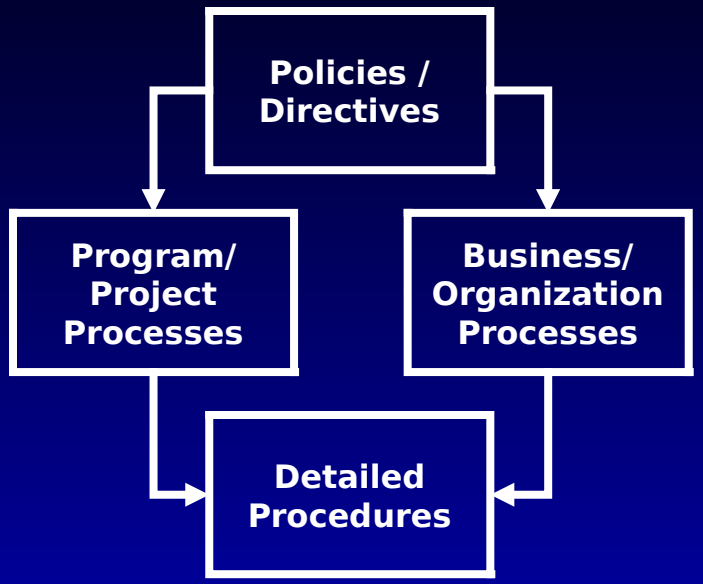
Asking the right questions... at the right time... by the right people



What Is the Effect of CMMI®?

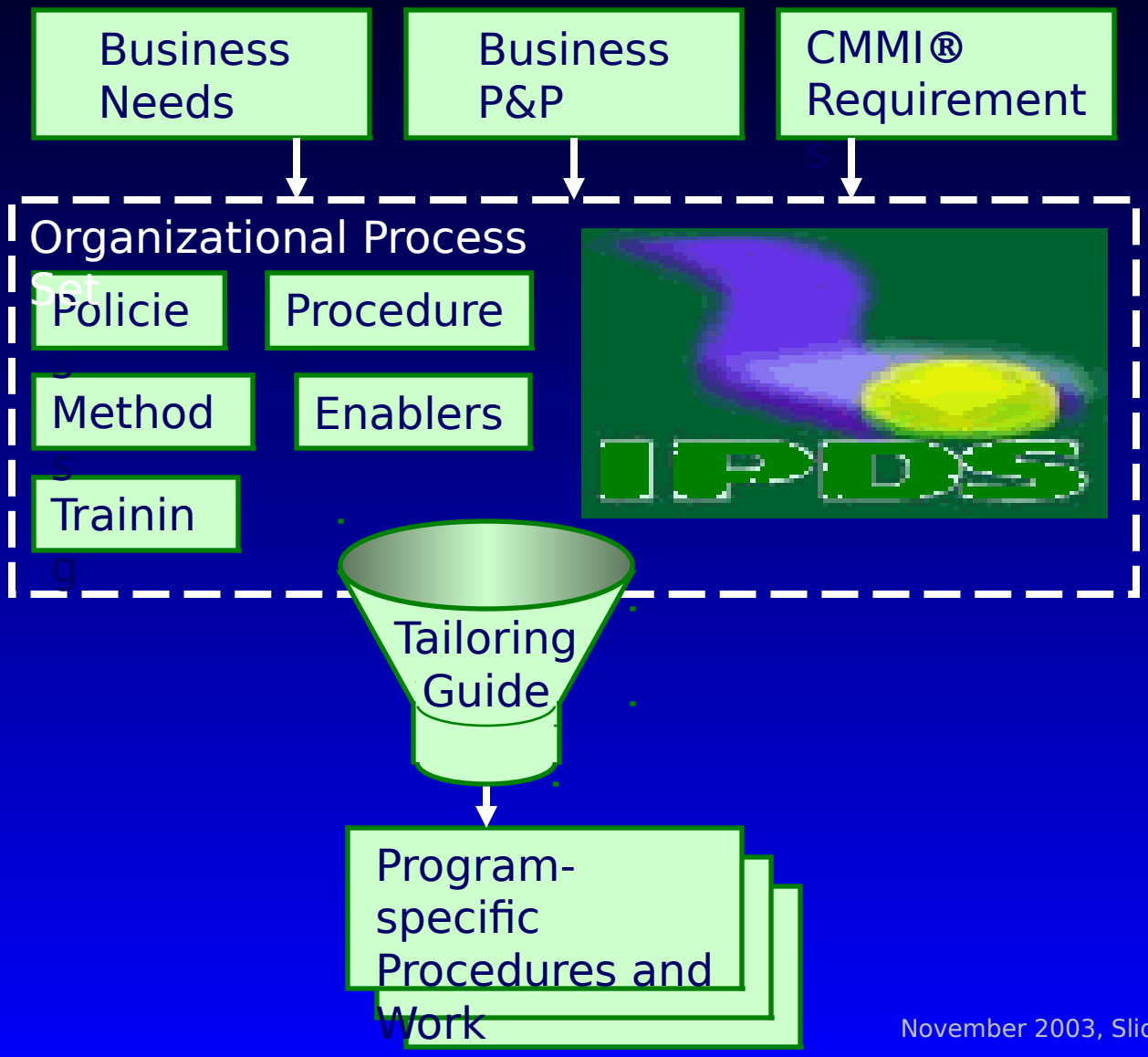
- **CMMI® addresses policies & directives, organizational processes, and detailed procedures in addition to project processes**
- **CMMI® imposes additional requirements on organizations**
  - **E.g., IPDS is based around and encourages use of IPTs but does not require them. CMMI® IPPD makes them a requirement.**
- **CMMI® provides a yardstick for process improvement**



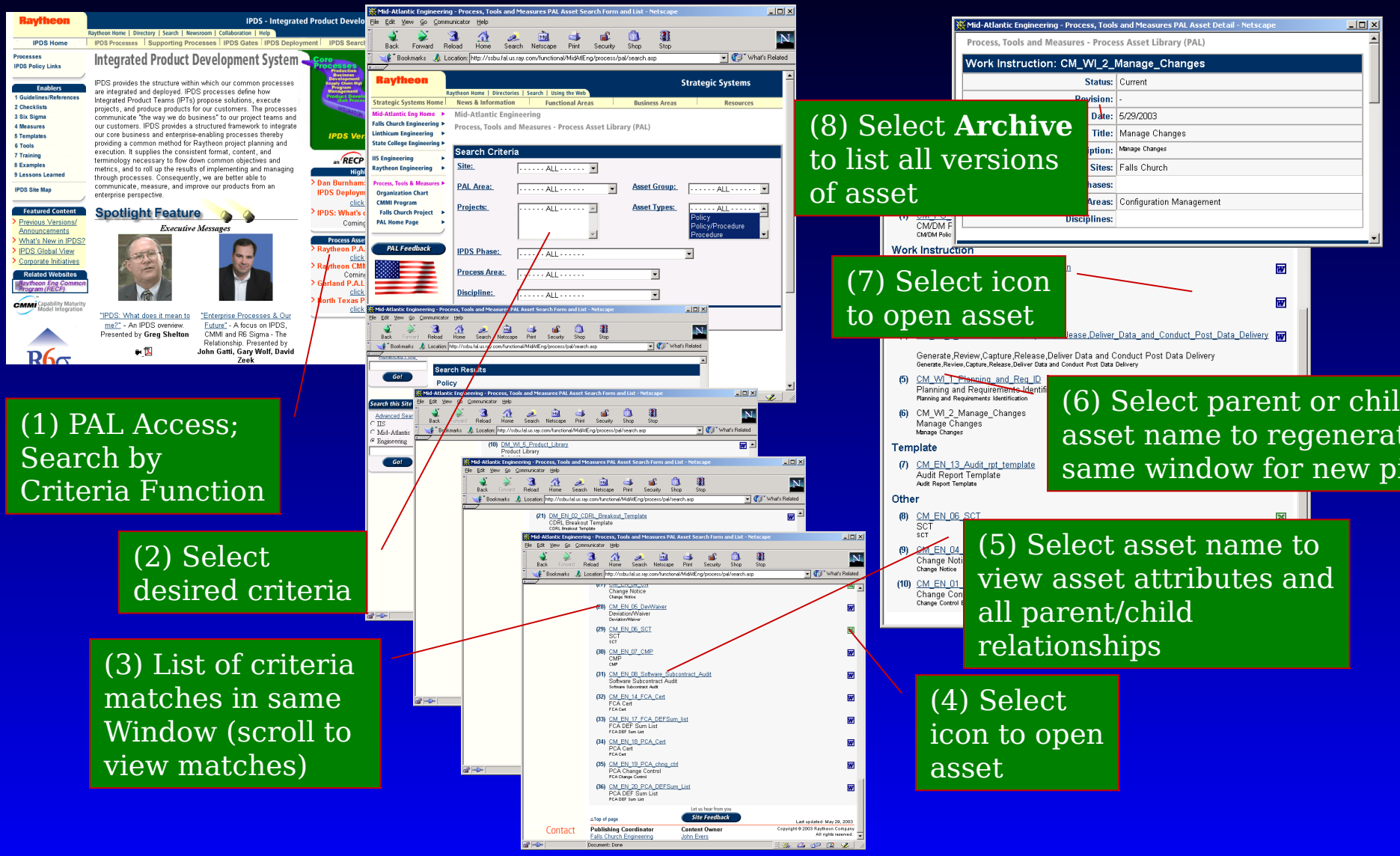
Programs are Using CMMI®-Aligned Processes (IPDS) – Organizational Integration and Documentation are Needed

Process Architecture

Local Materials augment and provide detailed "how to" for businesses at Raytheon sites



Process Asset Library Architecture


(1) PAL Access; Search by Criteria Function
(2) Select desired criteria
(3) List of criteria matches in same Window (scroll to view matches)
(4) Select icon to open asset
(5) Select asset name to view asset attributes and all parent/child relationships
(6) Select parent or child asset name to regenerate same window for new pic
(7) Select icon to open asset
(8) Select Archive to list all versions of asset
Integrated Product Development System
Spotlight Feature
Search Criteria
Search Results
Work Instruction: CM_WI_2_Manage_Changes

Lessons Learned

- **Process deployment model and method are as important as process documentation**
- **Organizational behavioral changes are primary factors critical to success**
- **Site engagement is critical to success against CMMI®**
- **Early program engagement is critical to realize benefits from integrated planning using common processes**
- **Closed, tightly coupled processes (low coherence, high dependence) can hinder improvements**
  - **Consistent top-level flow can synchronize processes**
  - **Think open process architecture**
  - **Important to identify and address common subprocesses, such as risk management and requirements management, as well as other supporting (call-able) subprocesses, such as decision analysis**

IPDS, CMMI®, and R6σ Support Each Other

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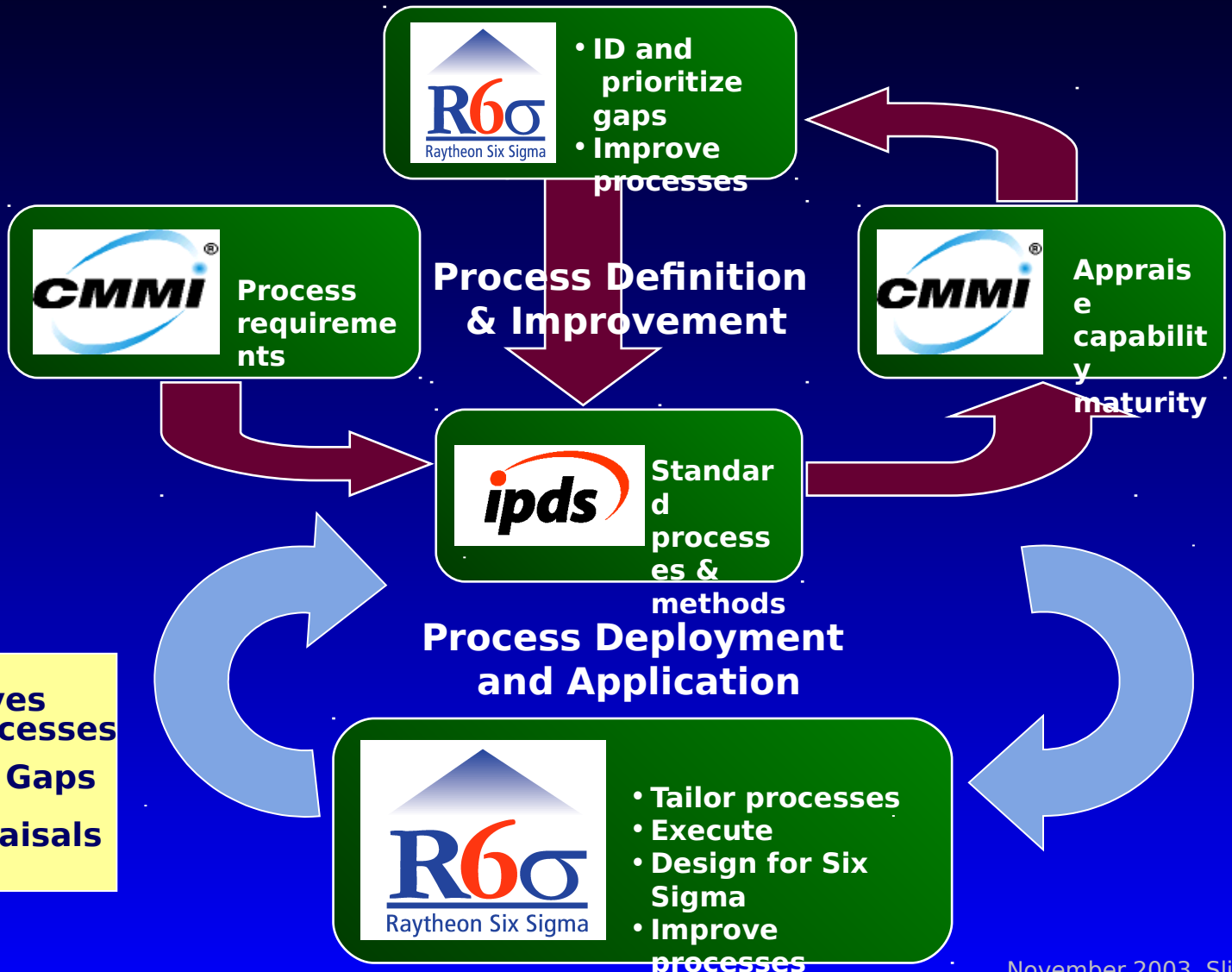

- R6σ Improves Program Processes
- R6σ Closes Gaps Identified by CMMI® Appraisals

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Questions

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